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Association of interleukin 2, interleukin 12, and interferon-γ with intervertebral disc degeneration in Iranian population

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Abstract

Background: Intervertebral disc degeneration (IVDD) is an age-related degenerative disease, presenting with low back pain or radicular pain. The inflammatory changes would occur in discs in the process of IVDD. Therefore, the inflammatory and anti-inflammatory cytokines, as well as their respective genes, have been proposed to play roles in pathophysiology of disease. This study has been conducted to elucidate the role of IL-2, IL-12, and IFN-γ single nucleotide polymorphisms (SNP) in this disease.

Method: Seventy-six patients who were diagnosed with IVDD and 140 healthy controls who complied with eligibility criteria were included. A total volume of 5 cc peripheral blood was obtained from each participant to investigate the IL-2 + 166G/T, IL-2 -330G/T, IL-12 – 1188A/C, and IFN-γ +847A/T SNPs through PCR-SSP method.

Results: The 'TG' and 'TT' genotypes of IL-2 – 330G/T polymorphism were significantly more common among patients and healthy controls respectively. The 'GT' and 'TT' haplotypes of IL-2 (comprised of -330G/T, and + 166G/T SNPs) were also more common among patients and controls respectively.

Conclusion: This study indicated the significant role of IL-2 genotypes and haplotypes in IVDD. These SNPs were differently distributed in patients and controls. Therefore, alteration in the structure of IL-2 gene could play an important role in pathophysiology of IVDD.

Keywords: Intervertebral disc degeneration, Single nucleotide polymorphism, Interleukin 2, Interleukin 12, Interferon γ, Immunogenetics, Cytokine

Background

Intervertebral disc degeneration (IVDD) is one of the common causes of discogenic low back pain, which is considered a frequent health problem in adults. This disease affects the patients' quality of life and also has the negative impact on the length of their productive life [1]. Although the mechanical load on the discs and aging are considered as the most important causes of IVDD, genetic and immunologic predispositions have been widely discussed especially in the past 2 decades [1]. Accordingly, the individuals with specific genetic predispositions, such as single nucleotide polymorphisms (SNP) of immunologic modulators and cytokines, would be more prone to develop IVDD. Also they might be affected with severe grades of IVDD or develop disease in younger ages [1].

Generally, innate immunity and inflammation play important roles in IVDD occurrence. The inflammation

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The current manuscript does not include any details, images, or videos relating to an individual person.

Competing interests
The authors declare that they have no competing interests.

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